San Diego Municipal Code

Land Development Code

Landscape Standards

Appendix E

Water Requirements Worksheets

LANDSCAPE WATER REQUIREMENTS WORKSHEET

This project worksheet is to be submitted to the City when the proposed development is subject to the water budget requirement in Chapter 14, Article 2, Division 4 (Landscape Regulations).

Project Name: _____ **Project #:** _____

Project Address: _____

Individual/Business Completing the Worksheet _____

Phone Number _____

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1. DEFINITIONS:

ET Adjustment Factor: A factor that when applied to reference evapotranspiration adjusts for plant water requirements and irrigation efficiencies, two major influences on the amount of water that is required for a healthy landscape.

Evapotranspiration: The quantity of water evaporated from adjacent soil surfaces and transpired by plants during a specific time period. Evapotranspiration data may be found at www.cimis.water.ca.gov. You may obtain a free pass word from the Department of Water Resources. The site also holds an abundance of informational links and complete instructions.

Hydrozone: A section or zone of the landscaped area having plants with similar water needs that are served by a valve or set of valves with the same schedule. A hydrozone may be irrigated or non-irrigated.

Landscape Area: The entire premises less the area of building footprints, non-irrigated portions of parking lots, driveways, hardscapes (as defined in §113.0103 of the Land development Code) , and areas designated for habitat preservation or brush management Zone 2.

Plant Factor: A factor that when multiplied by reference evapotranspiration, estimates the amount of water used by plants. Plant water use calculations are based on the list in WUCOLS III (www.owue.water.ca.gov/docs/**wucols**00.pdf). The average plant factor are as follows:

- *Low water using plants* is less than 0.2;
- *Medium water using plants* is 0.5; and
- *High water using plants* is 0.8.

Factors for non plant material are as follows:

- Water Features. The surface area of man made water features (pools, ponds, spas and similar features) are calculated using the co-efficient for high water using plants.
- Artificial Turf. The surface area of artificial turf is calculated using the co-efficient for low water using plants with a distribution uniformity (DU) of 1.0.

Special Landscape Area: Areas used for active and passive recreation areas, areas solely dedicated to the production of fruits and vegetables, and areas irrigated with reclaimed water.

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2. DETERMINE THE WATER BUDGET

Water Budget Calculation

The water budget is to be calculated using the following formula.

$$\text{Water Budget} = (\text{ETO})(0.62)\left[(0.7)(\text{LA}) + (0.3)(\text{SLA})\right]$$

Where:

ETo = Evapotranspiration (inches per year)(see Table 6 or ETo Map)
0.62 = Conversion factor (to gallons)
0.7 = Evapotranspiration Adjustment Factor
LA = Landscape Area (square feet)
0.3 = Additional Evapotranspiration Adjustment Factor for Special Landscape Areas
SLA = Special Landscape Area (square feet)

In the calculation below provide the values for the water budget calculation used for the proposed project. The ETo for the calculation may be based on the precise location of the project using the ETo Map or based on the ETo for the Community Planning Area in Table 6 of the Landscape Standards each of which follows.

(_____)(0.62) [(0.7)(_____) + (0.3)(_____)] = _____ Gal./Yr.
ETo LA SLA

ETo Map

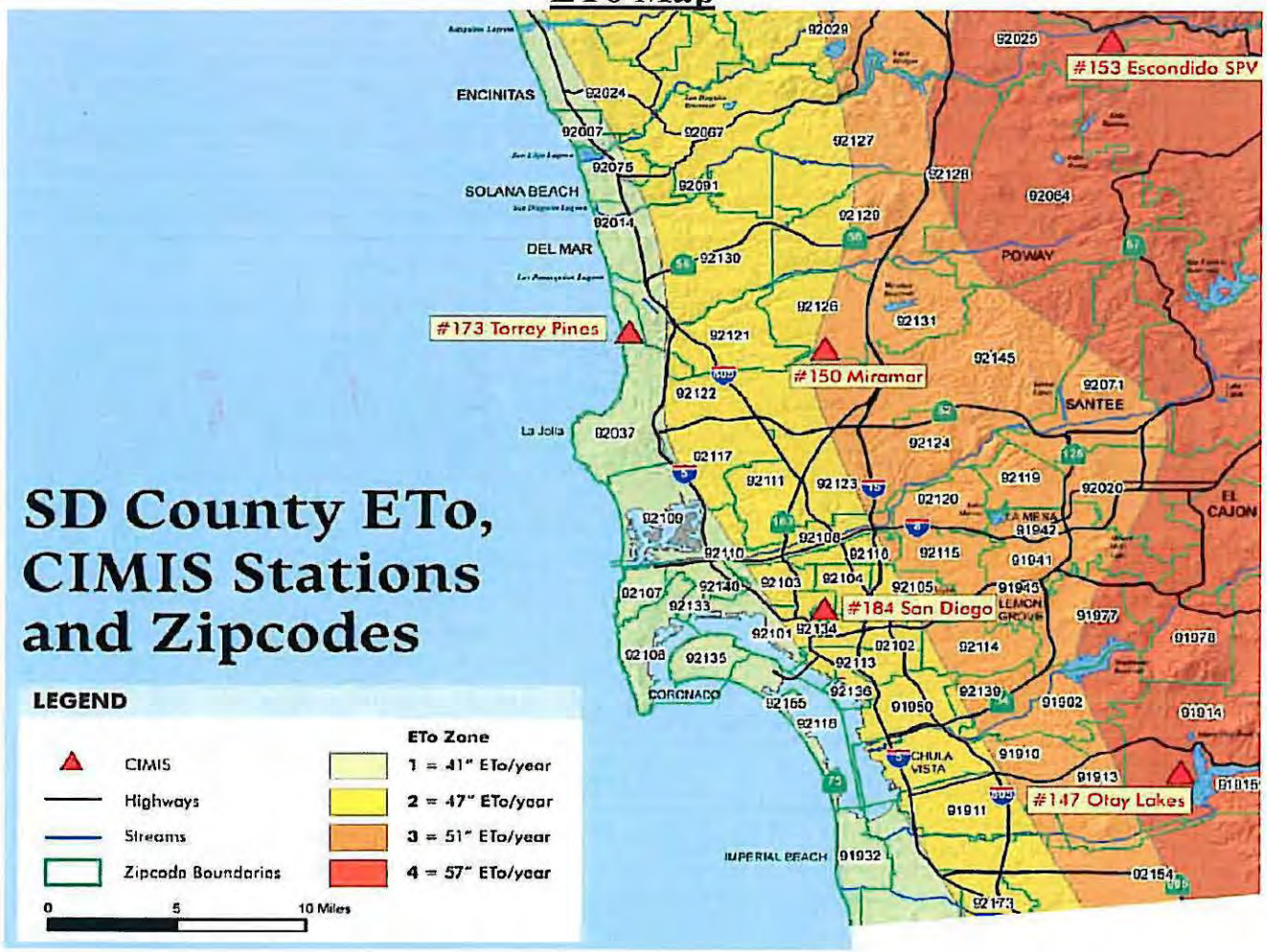
SD County ETo, CIMIS Stations and Zipcodes
LEGEND
CIMIS
Highways
Streams
Zipcode Boundaries
0
5
10 Miles
ETo Zone
1 = 41" ETo/year
2 = 47" ETo/year
3 = 51" ETo/year
4 = 57" ETo/year
#153 Escondido SPV
#173 Torrey Pines
#150 Miramar
#184 San Diego
#147 Otay Lakes
ENCINITAS
SOLANA BEACH
DEL MAR
La Jolla
POWAY
SANTEE
EL CAJON
LA MESA
LEMON GROVE
CORONADO
CHULA VISTA
IMPERIAL BEACH

Table 6
EVAPOTRANSPIRATION (ETo) TABLE
BY COMMUNITY PLANNING AREA

Community Planning Area	Average Annual ETo (inches/year)	Community Planning Area	Average Annual ETo (inches/year)
Barrio Logan	41	North City FUA Subarea II	47
Black Mountain Ranch	47	Ocean Beach	41
Carmel Mountain Ranch	51	Old San Diego	47
Carmel Valley	47	Otay Mesa	51
Centre City	41	Otay Mesa-Nestor	41
City Heights	47	Pacific Beach	41
Clairemont Mesa	47	Pacific Highlands Ranch	47
College Area	51	Peninsula	41
Del Mar Mesa	47	Rancho Bernardo	57
East Elliott	51	Rancho Encantada	57
Eastern Area	51	Rancho Penasquitos	51
Encanto	51	Sabre Springs	51
Fairbanks Country Club	47	San Pasqual	57
Greater Golden Hill	47	San Ysidro	47
Greater North Park	47	Serra Mesa	47
Kearney Mesa	47	Scripps Miramar Ranch	51
Kensington-Talmadge	51	Skyline-Paradise Hills	51
La Jolla	41	Southeastern San Diego	47
Linda Vista	47	Tierrasanta	51
Midway-Pacific Highway Corridor	41	Tijuana River Valley	41
Mira Mesa	47	Torrey Highlands	47
Miramar Ranch North	51	Torrey Hills	47
Mission Beach	41	Torrey Pines	41
Mission Valley	47	University	47
Navajo	51	Uptown	47
Normal Heights	47	Via De La Valle	47

3. DETERMINE THE ESTIMATED TOTAL WATER USE (ETWU)

The Estimated Total Water use is calculated using the following formula.

$$ETWU = [(ETo)(0.62)][(\underline{PF \times HA \div IE}) + SLA]$$

Where:

ETo = Reference Evapotranspiration (inches)
0.62 = Conversion facto to gallons
PF = Plant Factor from WUCOLS
HA = Hydrozone Area (s.f)
IE = Irrigation Efficiency

Irrigation Method and Efficiency					
Bubblers	0.85	Fixed Spray	0.55	Rotator Spray	0.70
Drip	0.90	Micro Sprays	0.70	Rotors	0.70
Drip Irrigation	0.80	MP Rotators	0.75	Spray Heads	0.60

Plant Water Use	Plant Factor	Also includes
Low	<0.1 -0.2	Artificial Turf
Moderate	0.3 – 0.7	
High	0.8 and greater	Water features
Special Landscape Area	1.0	

Use the following table to tack information about each controller in the system.

Controller No.	Hydrozone No.	Valve Circuit	Plant Factor (PF)	Hydrozone Area in s.f. (HA)	Irrigation Method	Irrigation Efficiency (IE)	% Total Landscape Area
						Total	

Then plug in the numbers from each controller/hydrozone into the ETWU equation. Then total the gallons per year of each controller/hydrozone for the Estimated Total Water Use per year. **The total ETWU cannot exceed the total Water Budget.**

Controller No.	[(ETo)(0.62)][(PF x HA ÷ IE) + SLA]	Result in Gallons per Year
	Total ETWU gallons per year	